PROFESSIONAL ENGINEER

Official Publication of American Association of Engineers

ENGINEER'S VOW OF SERVICE

Illinois U Library

We dedicate ourselves to the service of mankind as members of the Engineering Profession.

We consecrate our professional knowledge and skill to the advancement of human welfare, safety and progress.

As we benefit by the technical knowledge and public esteem won for the Profession by the Engineers who labored in the past, we shall ever strive to augment that heritage before passing it on to the Engineers who are to follow.

We therefore affirm our guiding purpose:

So to live and work as to justify the trust and confidence reposed in the Engineering Profession.

To carry out professional engagements with generous measure of performance, and with fidelity toward those whom we undertake to serve.

To foster a spirit of courteous consideration and fraternal co-operation within the Profession.

To extend encouragement and a helping hand to younger Engineers and to those in need.

To place Service before profit, the honor and standing of the Profession before personal advantage, and the Public Welfare above all other consideration.

Adopted by the Board of Directors, A.A.E., June, 1926

Copyrighted by the American Association of Engineers

Vol. 34 No. 2

Here are standard data compiled by 101 experts from all fields of

ELECTRICAL ENGINEERING

Brings you facts and figures, systems and measurements, materials and methods.

Leaders in the electrical engineering field swear by this reference book. It's an encyclopedia of facts and figures, definitions, conversion factors, physical and mathematical principles, accepted formulas, experimental data, etc. No other handbook in the field offers you so much essential information in such compact, easy-to-use, easy-to-find form.

Just Published

NEW, REVISED 8TH EDITION

STANDARD HANDBOOK for ELECTRICAL ENGINEERS

ARCHER E. KNOWLTON, Editor-in-Chief,
Senior Associate Editor "Electrical World"

and R. M. SHOOP, Assistant Editor,
Assistant Editor "Electrical World"

The 2311 pages of this great reference contain the combined experience and knowledge of leading specialists in the field. The most frequently required fundamental theories are covered as thoroughly as the wealth of new information and material packed into this guidebook. The STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS covers recent developments in the field . . . the chemical elements uncovered by atomic energy . . . magnetic materials . . . new insulations like synthetic rubber, other elastomers, and plastics . . . radar and associated microwave techniques . . . nuclear energy . . . equipment like servomechanisms and rotating regulators . . . in aviation, the entire new field of airplane power distribution . . . induction and dielectric heating.

This revised Eighth Edition includes a complete recasting of the much-consulted subject matter on conductors . . . a revamping of the sections on generators and transformers, affording a practical approach to "loading by temperature" . . . plus a wealth of data on scores of other important topics, clearly indexed for quick, finger-tip reference on the job. No significant item is left unidentified.

Order from
A.A.E. BOOK DEPARTMENT
8 So. Michigan Avenue, Chicago 3, Ill.

- **2311 pages**
- **1961 Illustrations**
- **over 600 tables**
- **$12.00**

Section Headings

1. Units and Conversion Factors
2. Electric Magnetic Circuits
3. Measurements
4. Properties of Materials
5. Circuit Elements
6. Transformers, Regulators, and Reactors
7. Alternating-current Generators and Motors
8. Direct current Generators and Motors
9. Rectifiers and Converters
10. Prime Movers
11. Power-plant Economics
12. Power System Electrical Equipment
13. Power Transmission
14. Power Distribution
15. Wiring Design—Commercial and Industrial Buildings
16. Illumination
17. Industrial and Commercial Power
18. Electric Heating and Welding
19. Electricity in Transportation
20. Electrochemistry and Electrometallurgy
21. Batteries
22. Wire Telephony and Telegraphy
23. Electronics and Electron Tubes
24. Radio, Radar and Carrier Communication
25. Codes and Standard Practices
26. Electrophysics

PROFESSIONAL ENGINEER

"The Voice of the Engineer"

★

Published Quarterly by

The American Association of Engineers

8 South Michigan Avenue, Chicago 3, Ill.

Volume 34 | June 30, 1949 | Number 2

Board of Directors

1948-1949

President
EDMUND J. FITZMAURICE
5821 Pine Street
Philadelphia, Penna.

Vice President
EARL F. RONNEBERG
7240 W. Pratt
Chicago, Ill.

EVERETT C. SHUMAN
2801 Gunkel Blvd.
Toledo 6, Ohio

C. J. ULLRICH,
422 Ness Bldg.
Salt Lake City, Utah

HOWARD R. PATTERSON
8 Carleton Road
Belmont 78, Mass.

L. S. NEEB
202 E. 6th Street
Tempe, Ariz.

PECOS H. CALAHAN
29 Business & Professions Bldg.
Sacramento, Calif

Secretary-Treasurer
M. E. McIVER
Chicago, Ill.

Table of Contents

	Page
Engineers!—Measure *up* to your Responsibilities	2
A.A.E. and the Student Engineer	3
North Idaho Junior College Awards Scholarships	6
A.A.E. Accomplishments	13
Illinois Engineers and Architects Examining Committee personnel	18

M. E. McIVER, Editor

American Association of Engineers assumes no responsibility for statements made or opinions expressed by contributors of articles published in Professional Engineer.

Entered as second-class matter May 5, 1933, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for in section 1103, Act of October, 1917, authorized August 9, 1918. Subscription price, U. S., $1.00 a year; Canada, $1.50; foreign, $2.00. Printed in U.S.A.

Copyrighted 1949 by American Association of Engineers.

Engineers...

12. Urge the importance of comprehensive planning, in order that needs of the community may be anticipated and relative importance of public improvements clearly understood.

11. Insist upon creation of boards to plan programs of public improvements.

10. See that registration laws are enforced and that all technological positions are filled by professional engineers.

9. Demand civil service protection of engineering judgment and integrity.

8. Organize in local and state societies, available for counsel on technological matters considered by other civic agencies.

7. Affiliate with Chamber of Commerce in order to cooperate in initiating programs and supporting those sponsored by civic agencies.

6. Open engineering society meetings to the public when community problems are discussed.

5. Help make every dollar of taxpayer's money count for civic efficiency.

4. Be individually alert in observing smaller needs of your community.

3. Remember that every educated citizen bears a responsibility iin a democracy to guide public opinion.

2. Establish close relations with service clubs and with the press.

1. Cultivate the art of describing technological projects and their social and civic significance in terms understandable by the laity.

Engineers! — Measure up to your Civic Responsibilities

A.A.E.

AND THE STUDENT ENGINEER

FRESHMAN year of a pre-engineering course is not too early for future engineers to begin learning the professional facts of life. "Professional facts" will not be listed in the catalogue as a required course; such a course is not even offered as an elective. Professional facts are only incidental in the programs of most of the extra curricular engineering organizations on the campus. Yet an understanding of these facts is essential to success in the practice of engineering, because engineering is not only a "profession" or "calling"—it is, it must be, a method of earning a livelihood. In no profession can financial returns be the only motivation or the first consideration. But no one except an ascetic can starve happily for the sheer privilege of serving society professionally.

American Association of Engineers believes that technological knowledge and skill and adherence to the highest standards of professional practice are matters of cardinal importance. No engineer really succeeds, no engineer deserves to succeed unless he has that native flair for mathematics and practical science which will permit him to master the fundamental principles of engineering, and apply them intelligently. No engineer succeeds or deserves to succeed who does not fully understand and accept the standards of conduct imposed by membership in a profession. But there are a great many soundly trained, competent engineers, imbued with the highest professional ideals, who have found engineering less rewarding in a financial way than vocations they might have chosen which require far less training, native ability, and consecration. There are two reasons why a great majority of men who qualify for practice of engineering through training and experience receive compensation not at all commensurate with the rigorous training it requires and the services performed. One of these reasons, however, is more or less an outgrowth of the other.

First of all, engineering training is so concentrated upon technology that it induces a mole-like preoccupation with the pure technique of engineering, and fails to develop the business sense, the understanding of economics, the group solidarity, the awareness of non-technical social responsibilities that are instilled into members of other professions. Second, and this condition is a result, in some degree of deficiencies in engineering training, engineering is regarded not as one profession, but as a federation of branches of engineering; it is also undefined in scope, merging with the technical crafts at its outer edge, and unrealistically delimited by its registration laws.

This lack of unity in engineering is due in part to the sharp differentia-

tion of branches which begins on the campus of engineering schools. There is no standard "last" over which engineers are made. Undergraduate training is not confined to fundamentals; specialization begins very early and sometimes at the expense of sound training in broad fundamentals. In college, therefore, engineers begin to think of themselves as civil engineers or mining engineers, or mechanical engineers, rather than as *professional* engineers. The same sort of differentiation governs extra-curricular activities; civils, mechanicals, electricals and miners organize apart from each other in societies to further their technical proficiency and demonstrate fraternalism. The condition is intensified after graduation.

This system leads to a sort of subserviency to eminence, rather than to fraternalism. Engineers are from the very beginning prone to believe that the degree of eminence is the measure of professionalism. They seek in their societies not fraternalism, but prestige, an opportunity to be identified with an aristocratic and distinguished organization, and to be associated, however perfunctorily, with the admitted leaders of the profession. Engineers are capable of the most obsequious regard for members of the profession who have attained eminence. They complain bitterly about the indifference of engineers in the higher echelons toward hardships and obstacles to professional progress encountered by engineers in training and routineers, but these same men would rather forfeit almost anything than the badges which proclaim that they belong to the same society as the topnotchers. Snobbishness obscures the real nature of many of engineering's basic problems.

American Association of Engineers was organized to supply certain deficiencies in engineering training, to offset certain weaknesses in engineering temperament, and to counteract some very dangerous and widely accepted fallacies about the nature of "professionalism." The Association was formed to enable engineers of all branches of the profession, in all stages of professional development, to cooperate in a single, truly fraternal organization, for improvement of the economic status of all members of the profession, for development of the personal efficiency of individual members, for organized service to their communities and the nation, and for integration of the engineering profession.

Before A.A.E. was organized there was a tabu against any organized effort to improve economic status. Any organized effort to increase salaries and fees was dubbed "unprofessional" by the conservatives who then dominated all technical societies. American Association of Engineers proved that members of the profession could through organization raise salaries and fees, set up standards of classification and compensation, classify services and establish schedules of fees, and that all these things could be done by methods consistent with the highest principles of professional conduct. It was American Association of Engineers that first codified principles of professional conduct and enunciated a code of ethics and sponsored a vow of service. It was American Association of Engineers that first attempted a

classification of engineering schools and urged broadening of the curriculum. It was the first organization that aggressively supported the registration movement, and is the only organization today that, having discovered defects in the laws by a study of the statutes in operation, demands drastic revision and strengthening of registration laws, so that they will realistically define engineering and protect engineers in all stages of professional development.

American Association of Engineers was the first organization to institute an employment service, and it was violently criticized for so doing on the grounds that such an activity was vulgar and unprofessional. Nevertheless, the Association has used that department as a laboratory in which it has assembled authentic data for studies of the market for engineering services, as an agency for vocational guidance, and as a lookout station to observe trends and thus secure advance information for members of the profession.

American Association of Engineers was the first national organization to establish student chapters in engineering colleges. In the A.A E. chapters all engineering students recognized fraternal ties which transcended loyalty to a particular branch, and which made all the students, freshmen as well as seniors, part of a single, thoroughly unified professional organization. In these chapters students rounded out their training, securing in their meetings and programs training in "professional" as distinguished from technical problems not covered by their credit courses. American Association of Engineers is still prepared to do these things. No other national organization yet affords the students on any campus an opportunity to weld into a single chapter all the engineering students on the campus. Only in A.A.E. chapters can civils, mechanicals, chemicals, miners, and electricals form a single, closely integrated unit. Only in an A.A.E. chapter can they disregard rank or advancement and weld freshmen, sophomores, juniors and seniors into a unit, because all the other national societies restrict their chapter membership to upper classmen. The technical societies have nothing to offer students in junior colleges.

In another vital way, A.A.E student chapters differ from others. A.A.E. chapters are pledged to devote a major part of their time and attention to "economic and professional problems." In an A.A.E. chapter you can and should learn about the market for engineering services; this means that you will study A.A.E. surveys and reports which show the qualities, the services, the personal attributes, that bring a premium in the market—as indicated in the demands made by employers which they ask A.A.E. to locate engineers of particular types for specific jobs.

You will learn how to write a letter of application for a position, how to prepare an effective experience record, how to apply in person for a position, what salary you can reasonably expect. You will learn how the Federal Labor laws affect you, and what stake you have in the Government's Social Security program. You will study our registration laws and learn how to

qualify for registration and what advantages may be derived from it. You will learn about non-technical vocational opportunities in fields where your engineering training is only a background but commands a premium. You will be urged to learn something about accountancy, business law, and general economic conditions and told why it will be profitable to extend your collegiate training by means of such courses. You will be encouraged to study and practice public speaking. You will be advised to adopt a constructive hobby, preferably one of a gregarious nature which will bring you into cordial relation with business men and members of other professions. You will be shown that the only effective hedge against the "forty year deadline" must be begun by the time you are 25.

You will be asked to investigate the many opportunities for civic service—especially those in which engineering training is a unique advantage. You will be told why capable performance of civic services—beyond the line of duty—can be profitable as well as innately satisfying.

A.A.E. which operates its student chapters on a no-profit plan (except for the loyalty it engenders in men who will eventually become loyal members and the leaders it trains in student chapters) is glad to sponsor student chapters, but does not want them to content themselves with a purely social program, or devote all their time to visiting engineering projects. Instead A.A.E. wants its student chapters to embrace its four point programs and try, through study and investigation, to learn more about that program which is summed up in A.A.E.'s stated purpose:

"To improve the economic status of the Engineer, to stimulate public service in the profession; to encourage and develop the efficiency of the Engineer, and to promote unity in the profession."

North Idaho Junior College

ON APRIL 1 a Vocational Guidance Conference was held at North Idaho Junior College, Coeur D'Alene, Idaho, and eleven scholarships were awarded. Glen Brandvold, a senior at Coeur D'Alene high school won the Engineering award.

The scholarships amount to $100, and are to be used to pay educational expenses at North Idaho Junior College. The engineering scholarship was donated by the Washington Water Power Company, a distributor of electric power in the Pacific North West. George F. DeFoe, Division Sales Manager, for the Company, presented the scholarship to Mr. Brandvold.

In a letter to Headquarters, D. H. Moser, Head, Guidance Department at North Idaho Junior College, a member of A.A.E. and sponsor of the Association's Student Chapter at the college, has this to say about the winner, and the contest.

North Idaho Junior College Chapter, A.A.E., was formed in 1947 with Dexter H. Moser, engineering instructor, N.I.J.C., industrial engineer and member, A.A.E., as advisor.

The group holds bi-monthly dinner meetings to which the practicing engineers in the community are invited.

Left to right: Glen Branvold, winner of Washington Water Power Co. Engineering Scholarship. Gordon Defoe, Division Sales Manager, Washington Water Power Co.

"Glen has been a scholar all along the line, and is desirous of going into engineering education work. He was born and raised in Coeur d'Alene, attending both the public schools and high school there. Besides his interest in scholarship, Glen is quite a fisherman, as indeed most everyone is who lives in North Idaho where the famous Kamloop trout abounds. He distinguished himself at our Vocational Guidance Conference by taking first place in the engineering aptitude test and second in the general scholarship test. As the rules of our conference do not allow the awarding of two scholarships to one person, Glen chose the engineering scholarship and the alternate received the general scholarship award."

"The upper 40% of the senior class in each high school in the junior college district was invited to attend. One hundred students participated in the conference. The scholarship contest was held in the morning. Lunch was served by the local Chamber of Commerce, and in the afternoon lectures were given to the students on guidance, the main one being given by Charles Tyson, public relations officer for the Interstate Telephone Company. Eleven scholarships were given on the ratio of one to each school on the basis of 20 participating students.

"This conference is a part of our overall community guidance program. Guidance tests and counseling are given to all juniors and seniors in the high schools in the college district. The tests given in the contests were also filed in the personnel folders to be used in our guidance work."

P. A. Christianson Dr. Earl Ogg, and Frank Evans are other faculty members of the engineering and forestry departments of NIJC.

M.I.T. To Award "Engineer" Degree

A new terminal degree for practicing engineers, to be called the "Engineer" degree, has been approved at the Massachusetts Institute of Technology and is expected to be awarded for the first time at the Institute's commencement this June, according to a recent announcement made by Dr. John W. M. Bunker, Dean of the Institute's Graduate School.

The new degree will be recommended for students who complete an individually-planned, two-year program of study and research at the Institute beyond their undergraduate degrees. Emphasis will be placed upon engineering practice rather than on the research which is characteristic of a program of study leading to a Ph.D. degree.

When the field of specialization is to be indicated, the Engineer degree will be referred to as follows: Civil Engineer, Mechanical Engineer, Metallurgical Engineer, Electrical Engineer, Chemical Engineer, Sanitary Engineer, Marine Mechanical Engineer, Naval Architect, Naval Engineer, Aeronautical Engineer, Building Engineer, and Meteorologist.

The degree "Engineer," with the field of specialization designated, will require about two years' study following a bachelor's degree in any one of the Institute's various engineering departments.

"The new degree," says Dean Bunker, "fills an educational need for the development of professional engineering competence at a higher level than is ordinarily represented by the Master of Science degree."

John Walter Moore, age 77, died at his home in Terrace Park, Ohio.

Mr. Moore during his early career as a civil engineer surveyed virgin railroad lines in the South. He received an appointment as a Federal highway engineer with the Bureau of Public Roads in 1919. He served two years in Arizona. He was transferred to Chicago in 1921 where he remained until 1940, when he retired, acting as senior highway engineer for the State of Indiana.

Ernest A. Taylor, Member A.A.E., and a co-worker.

Here's an engineer who thoroughly enjoys his work. A glance at his photograph confirms the statement. Mr. Taylor writes interestingly of his work on Filter Plant, at Richmond, Va. The new plant will be rated at 66,000,000 gallons daily, as compared with the present 30,000,000-gallon capacity. It is expected the new unit will be in full operation in September.

ADVENTURES

IN

MAN'S FIRST PLASTIC

The Romance of Natural Waxes

by Nelson S. Knaggs
Chemist, author and photographer

Not a technical book, but an exciting and beautifully illustrated story of adventure in one of the oldest and most intriguing of man's world-wide business ventures.

100 pages of pictures.

325 pages of text relating the experiences of the author, and the entire panorama of the history and applications of natural waxes through the centuries.

$6.75 a copy

Order from the
A.A.E. BOOK DEPARTMENT
8 So. Michigan Ave., Chicago 3, Ill.

A.A.E. *Accomplishments*

Established an organization in which engineers of all branches, and in all stages of professional development may cooperate to advance.

Made and published studies concerning factors which have promoted solidarity in other professions.

Supported campaigns for engineering registration laws in 35 states.

Coaching local leaders, supplying literature, speakers, funds in 27 states.

Prepared and published "Survey of our Registration Laws" showing their weakness in comparison with licensure of doctors, lawyers, dentists.

Prepared and published studies of laws in operation, showing difficulties of enforcement and administration in "Missing Molars in Our Registration Law" series.

Aided in forming the National Council of State Boards of Engineering Examiners.

Participated in joint society conferences to draft and revise the Model Law.

Crystallized and enunciated "Specific Principles of Professional Conduct" from actual "practice cases" and decisions.

Prepared and published "Code of Ethics."

Prepared and published "A Vow of Service."

Published studies on "ethical codes" of other professions and their methods of enforcing them.

Pioneered in employment service and vocational guidance.

Freed engineers of reliance on commercial employment agencies and their unreasonably high fees.

Placed more than 25,000 engineers in positions.

Engaged in systemmatic study of employers' desires as shown in employment service data.

Published Vocational Guidance in Engineering Lines.

Published "The Market for Engineering Services, 1940."

Published "Before and After VJ Day" survey of market.

Published series of practical bulletins on "selling services," preparing experience records and applications, interviews, etc.

Published series of articles on employment opportunities in non-engineering fields for men with engineering training.

Promoted efficiency of engineers.

Through chapters established extension courses in English, public speaking, accountancy, business law, etc.

Stimulated interest in self-instruction, through technical books, meetings, etc.

Published instructive and inspirational articles prepared by employers, deans of engineering schools, sociologists, etc.

Pioneered in classification of engineering schools.

Published articles urging broadening of engineering training.

Conducted campaign to eliminate dishonest trade and correspondence schools and induce substantial schools to set up and maintain higher standards.

Conducted campaign for better compensation of engineering educators and better qualified teachers in the engineering schools.

Formed student chapters to acquaint prospective engineers with economic and professional problems.

Conducted campaign for more adequate compensation for employee-engineers.

Secured increases averaging $5,000,000 annually for railway technical men.

Secured substantial increases for Navy technical men.

Secured equitable adjustment of retirement benefits for federal civi service employees.

Prepared and supported salary schedules for municipal employees.

Prepared and supported salary schedules for county employees.

Directed campaigns and secured salary increases for municipal engineers in 8 cities.

Directed campaigns and secured increases for state and county engineering employees.

Published Specifications for Engineering Positions in the Highway Field.

Published Recommended Schedule of Fees for Engineers in Public Service.

Published Standards on the Classification and Compensation of Professional Engineering Positions.

Published "Incomes of Professional Engineers in Public Employment."

Conducted studies and prepared and published schedule of fees for engineers in independent practice.

Published "How to Employ and Use Engineering Services."

Published "Publicity Methods for Engineers."

Opposed government intrusion on field of private practice.

Opposed legislation intended to impose unfair restraints on patents and individual rights to benefits from inventions.

Oppose measures designed to "regiment" technology (Kilgore bills, etc.).

Opposed "free engineering services" of manufacturers, dealers, etc.

Opposed appointment of non-engineers to positions involving technological knowledge and skills.

Opposed unionization of professional employees because of its tendency to destroy unity in the profession.
Blocked unionization of railway and Navy technical men.
Conducted systemmatic study of Wagner Act in operation:
Reported all developments in PROFESSIONAL ENGINEER.
Published TECHNOLOGISTS' STAKE IN THE WAGNER ACT.
Published series of articles called "Exploded Views of the Wagner Act."
Aided employee groups opposed to absorption in heterogeneous unions.
Campaigned for amendment of the Wagner Act to restore freedom of association to professional engineers.
Published TECHNOLOGISTS' STAKE IN THE TAFT-HARTLEY ACT.

Provided Personal Service and Benefits to Individual Members.

Legal research and guidance.
Information and advice on patents and inventions.
Book and equipment information and service.
General information service.
Miscellaneous personal service.
Free accident and dismemberment insurance.
Vocational guidance and placement service.

Stimulated Public Service in the Profession.

Championed National Department of Public Works.
Campaigned for "engineers in engineering positions."
Published report on "Public Improvements and the Tax Rate."
Supported Civil Service Reforms; championed rights of individuals and groups under civil service regulations.
Opposed regimentation of engineers; demanded effective use of engineers in defense program.
Aided all branches of government in finding personnel for special services (civilian and military) during World War I and II.
Cooperated with Red Cross, Community Chest, and other welfare agencies.
Assisted federal agencies in securing data for special studies (fuel, highways, conservation, personnel, etc.)
Through chapters participated in community activities.
Publicized "reconversion" and "demobilization" plans and sought cooperation of engineers.
Made a survey of the civic attitudes and activities of engineers throughout the nation.

Conducted systemmatic campaign to improve public relations of profession.

Coached chapters in publicity techniques; engaged world famous public relations experts to direct the project.
Established contacts, and released volume of publicity on achievements of engineers and the social value of their work.
Recognized public service by individual engineers and engineering groups.
Acquainted many communities with work of their engineers.
Organized "Public Relations Committee of the Whole," with three working divisions, "Fact Finders," "Clipping Club," and "Listeners-In" Club.
Made and published systemmatic study of engineering's portrayal in advertising, fiction, movies, radio, columns, editorials, news stories, etc.
Exposed "Self-styled" engineers to ridicule.
Through PROFESSIONAL ENGINEER interpreted engineering to the laity.
Sponsored radio broadcasts, meetings, etc., to emphasize the social and economic importance of engineering—society's reliance on good engineering.
Consistently emphasized the "human side of engineering"—service to the profession and service to society.

JOIN

American Association of Engineers

To promote unity in the profession
To cooperate in its activities which pertain to—

Engineers' { Business Problems / Civic Responsibilities / Public Relations

ORGANIZED 1915 COOPERATE—ADVANCE

Available

The third volume of

STEEL AND ITS HEAT TREATMENT

by D. K. BULLENS, *Fifth Edition prepared by the Metallurgical Staff of Battelle Memorial, directed by* H. W. GILLETT, *Chief Technical Adviser.*

Volume III—Engineering and Special-Purpose Steels

This final volume of the fifth edition correlates the known facts about the more complicated alloy and special steels and their heat treatment with fundamental principles insofar as the known facts are complete enough and consistent enough to permit. Such steels as carbon, mild alloy, N.A.E., S.A.E., and tools are discussed. This book covers the effect of heat treatment on the suitability of these steels for various uses as well as the possibilities of utilizing alternate steels.

May 1949 607 pages 295 illus.
6 x 9¼ $7.50

To complete the set:

Volume I—Principles

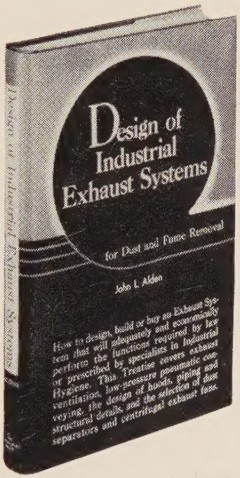
1948 489 pages 262 illus.
6 by 9¼ $6.00

Volume II—Tools, Processes, Control

1948
289 pages
118 illus.
6 by 9¼
$4.00

Order from A.A.E. Book Dept.
8 So. Michigan Ave., Chicago 3, Ill.

A COMPLETELY SELF-CONTAINED TREATISE ON THE DESIGN OF INDUSTRIAL *Exhaust Systems*


Design of Industrial Exhaust Systems
for Dust and Fume Removal
John L. Alden
How to design, build or buy an Exhaust System that will adequately and economically perform the functions required by law or prescribed by specialists in Industrial Hygiene. This Treatise covers Exhaust Ventilation, low-pressure pneumatic conveying, the design of hoods, piping and structural details, and the selection of dust separators and centrifugal exhaust fans.

2nd Edition
Completely Revised
252 pages
120 Drawings, Charts and Diagrams

$3.50

Postpaid in U. S.

By
John L. Alden
Assistant Works Manager of the Western Electric Company's Kearny plant.

For—

SHEET METAL CONTRACTORS
CONSULTING ENGINEERS
INDUSTRIAL HYGIENE ENGINEERS
STUDENTS — ARCHITECTS
VENTILATING ENGINEERS
INDUSTRIAL PLANT ENGINEERS

Here, in one complete volume, is the information you need to design, build or buy an industrial exhaust system that will efficiently perform its functions as prescribed by the industrial hygiene expert or by law.

DESIGN OF INDUSTRIAL EXHAUST SYSTEMS presents the facts you need about various types of exhaust systems for the removal of dust—fumes—vapors—gases—steam. Concise information is also included on low pressure conveyors for carrying bulky materials, such as grain or sawdust, by air stream.

Drawings, diagrams and charts—120 in all—are used throughout the book to present the data in the most concise and understandable form.

Order your copy today from
A.A.E. BOOK DEPARTMENT
8 SO. MICHIGAN AVE., CHICAGO 3, ILL.

Power . . . Telephony
Ultrahigh frequencies . . .
all covered in—

ELECTRICAL TRANSMISSION of POWER and SIGNALS

By EDWARD W. KIMBARK

Including:

The transmission of power and signals by wire.

Transmission lines as resonant circuits, insulators, pulse formers, delay lines, and impedance transformers.

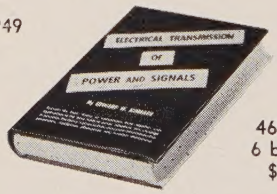
Transmission-line theory applied to filters and other recurrent networks, to waves in free space, and to wave guides.

Application of transmission-line transients to the protection of high-voltage power transmission lines against lightning and to the formation of pulses for a radar transmitter.

Information on the calculation of inductance and capacitance of transmission lines.

Tables and curves giving characteristics of transmission-line conductors and of typical high-voltage power transmission lines, power distribution lines, power cables, open-wire telephone lines, nonloaded and loaded telephone cables, submarine telegraph cables, and flexible and rigid coaxial radio-frequency lines.

1949



462 pp.
6 by 9¼
$6.00

For Sale by A.A.E. Book Dept.

8 So. Michigan Ave. Chicago 3, Ill.

Personnel—Illinois Examining Committees

Following are the names and addresses of members of the Professional Engineers' Examining Committee, Structural Engineers' Examining Committee, and Architects' Examining Committee, for the State of Illinois:

Professional Engineers' Examining Committee

Thomas Shedd, Chairman
Professor of Structural Engineering
306 Engineering Hall
University of Illinois
Urbana, Illinois.

Dr. George G. Lamb
1914 Sheridan Road
Evanston, Illinois

Mr. Everett J. Wendell
County Superintendent of Highways
Peoria County
County Court House
Peoria, Illinois

Mr. Ralph Sargent
Sargent & Lundy, Engineers
140 South Dearborn Street
Chicago, Illinois

Mr. E. Roy Wells
Illinois Postwar Planning Commission
322½ East Adams
Springfield, Illinois

Mr. R. M. Lobdell
County Superintendent of Highways
Lake County
Waukegan, Illinois

Mr. Titus George LeClair
Chief Staff Engineer
Commonwealth Edison Company
72 West Adams Street
Chicago, Illinois

Dr. Edwin R. Whitehead, Director
Department of Electrical Engineering
Illinois Institute of Technology
3300 South Federal Street
Chicago 16, Illinois

Mr. J. A. Bottomley
111 West O'Gara Street
Harrisburg, Illinois

Structural Engineers' Examining Committee

Isaac F. Stern
38 S. Dearborn Street
Room 1448
Chicago, Illinois

IF YOU ARE A STAMP COLLECTOR YOU KNOW AND USE SCOTT'S STANDARD POSTAGE STAMP CATALOGUE

Combined Edition
Vol. 1 and Vol. 2 bound together, cloth.....$7.00

Vol. 1—The Americas and British Commonwealth of Nations. Bound with paper-covered boards $3.50

Vol. 2—The Nations of Europe, Africa and Asia, and their Colonies. Bound with paper covered boards.....$3.50

UNITED STATES STAMP CATALOGUE (Specialized)

The World's leading catalogue of U.S. Stamps—published annually, extensively illustrated.....$3.50

THE INTERNATIONAL ALBUM (formerly the Junior)

This Album provides for a representative collection of 19th and 20th Century postage stamps of the World.
Part 1—1840-1940, bound in boards.....$6.00
Loose leaf, Fabrikoid hinged post binder....$9.00
Part 2—1940-1946, Fabrikoid hinged post binder....$8.00

ORDER YOUR SCOTT Albums from A.A.E. Book Department
8 So. Michigan Ave. Chicago 3, Illinois

T. L. Condron,
212 S. Scoville Avenue
Oak Park, Illinois

Arthur R. Harris
1633 Farwell Avenue
Chicago 26, Illinois

Thomas Shedd
Professor of Structural Engineering
306 Engineering Hall
University of Illinois
Urbana, Illinois

Clifford H. Westcott
Westcott Engineering Co.
1418 Engineering Building
Chicago, Illinois

Architects' Examining Committee

Professor F. M. Lescher
1005 South First Street
Champaign, Illinois

John J. Fox
549 W. Randolph
Chicago, Illinois

W. Fred Dolke, Jr.
189 W. Madison Street
Chicago, Illinois

Elbert I. Harrison
Madison Theatre Building
Peoria 2, Illinois

Charles H. Dornbusch
936 N. Michigan Avenue
Chicago, Illinois

A.A.E. Headquarters would like the address of
James R. Travis
formerly 1237 S. 113th Street
Milwaukee, Wisconsin

Thermodynamic Charts for Combustion Processes

By HOYT C. HOTTEL
Professor of Fuel Engineering and Director, Fuels Research Laboratory

GLENN C. WILLIAMS
Associate Professor of Chemical Engineering;

and CHARLES N. SATTERFIELD
Assistant Professor of Chemical Engineering; all at the Massachusetts Institute of Technology

Thermodynamic Charts for Combustion Processes meets today's need for a more exact thermodynamic description of fuels.

The book is printed in two parts, each of which is sold separately. The first contains a review of the principles of cycle calculation, plus a series of full page thermodynamic charts covering all mixtures of carbon, hydrogen, oxygen, and nitrogen.

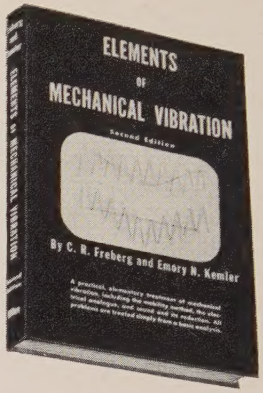
April 1949 75 pages $2.60

The second part contains eight large charts which map the thermodynamic characteristics of certain hydrocarbon-fuel-air combinations in detail. These charts enable one to treat quantitatively any cycle falling within the range of the variables covered. Part II also contains a set of tables giving the thermodynamic properties and equilibrium gas compositions for 80 fuel mixtures.

January 1949 24 pages 8 charts $2.40

For Sale by A.A.E. Book Dept.
8 So. Michigan Ave. Chicago 3, Ill.

For engineers in industry—



ELEMENTS OF MECHANICAL VIBRATION

Second Edition

By C. R. FREBERG and EMORY N. KEMLER

The latest edition of a popular book offers you the latest data on the subject and—

- Discussions of the chief elements of mechanical vibration.
- A new chapter on sound and its reduction.
- A whole chapter devoted to beam problems.
- An uncomplicated mathematical notation.
- Methods and formulas to use, along with directions for using them.

The book is, furthermore, the only one on vibration with the mobility method, the electrical analogue,—and the above-mentioned treatment of sound and its reduction.

1949 227 pages 184 illus.
6 by 9¼ $3.75

For sale by A. A. E. Book Dept.
8 So. Michigan Ave., Chicago 3, Ill.